

WHAT IS CLAIMED IS:

1. An information recording medium comprising:
a substrate; and

a print pattern formed on the substrate and
5 containing

a first colorant which changes at least one
property selected from the group consisting of a color
and a dielectric constant of the first colorant upon
application of a first electromagnetic field having a
10 first intensity, and

a second colorant which behaves differently
from the first colorant upon application of the first
electromagnetic field.

2. The medium according to claim 1, wherein the
15 first colorant changes the color upon application of
the first electromagnetic field, and the second
colorant maintains a color of the second colorant
unchanged independently of the intensity of an
electromagnetic field applied.

20 3. The medium according to claim 1, wherein the
first colorant changes the color upon application of
the first electromagnetic field, and the second
colorant maintains a color of the second colorant
unchanged upon application of the first electromagnetic
25 field and changes the color of the second colorant upon
application of a second electromagnetic field having
a second intensity higher than the first intensity.

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4. The medium according to claim 1, wherein the first colorant changes the color of the first colorant upon application of the first electromagnetic field, the second colorant changes a color of the second colorant upon application of the first electromagnetic field, and a time required for the first colorant to change the color of the first colorant after application of the first electromagnetic field differs from a time required for the second colorant to change the color of the second colorant after application of the first electromagnetic field.

5. The medium according to claim 1, wherein the first colorant changes the dielectric constant of the first colorant upon application of the first electromagnetic field, and the second colorant maintains a dielectric constant of the second colorant unchanged upon application of the first electromagnetic field.

6. The medium according to claim 1, wherein the first colorant containing liquid crystal microcapsules each comprising a liquid crystal material and a film encapsulating the liquid crystal material.

7. The medium according to claim 6, wherein the liquid crystal material contains a dichroic dye.

8. The medium according to claim 7, wherein the second colorant contains liquid crystal microcapsules each comprising a liquid crystal material containing

a dichroic dye and a film encapsulating the liquid crystal material.

9. The medium according to claim 8, wherein an average grain size of the liquid crystal microcapsules in the first colorant differs from an average grain size of the liquid crystal microcapsules in the second colorant.

10. The medium according to claim 1, wherein a surface of the substrate to which the print pattern is provided is conductive, and the medium further comprises a transparent electrode which faces the conductive surface of the substrate with the print pattern sandwiched therebetween.

11. The medium according to claim 1, wherein the print pattern comprises a first pattern containing the first colorant and a second pattern containing the second colorant.

12. The medium according to claim 11, wherein the first and second patterns form at least one pattern selected from the group consisting of a bar code pattern and a dot matrix pattern.

13. A method of reproducing information recorded on an information recording medium, which comprises a substrate and a print pattern formed on the substrate and containing a first colorant which changes at least one property selected from the group consisting of a color and a dielectric constant of the first colorant

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the reproduction of the information comprises applying the second electromagnetic field, thereby developing an image I_{g2} different from the image I_{g0} and the image I_{q1} .

16. The method according to claim 13, wherein
the first colorant changes the color of the first
colorant upon application of the first electromagnetic
field, the second colorant changes a color of the
5 second colorant upon application of the first
electromagnetic field, and a time required for the
first colorant to change the color of the first
colorant after application of the first electromagnetic
field differs from a time required for the second
10 colorant to change the color of the second colorant
after application of the first electromagnetic field,
and

the reproduction of the information comprises
applying the first electromagnetic field to the medium,
15 thereby sequentially developing an image I_{gt1} different
from an image I_{g0} maintained when no electromagnetic
field is applied and an image I_{gt2} different from the
image I_{g0} and the image I_{gt1} .

17. A method of discriminating an information
20 recording medium, which comprises a substrate and
a print pattern formed on the substrate and whose
genuineness is unknown, between a counterfeit
information recording medium and a genuine information
recording medium which comprises a substrate and a
25 print pattern formed on the substrate and contains a
first colorant which changes at least one property
selected from the group consisting of a color and a

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dielectric constant of the first colorant upon application of a first electromagnetic field having a first intensity and a second colorant which behaves differently from the first colorant upon application of the first electromagnetic field, comprising:

applying an electromagnetic field to the medium whose genuineness is unknown.

18. The method according to claim 17, wherein

the first colorant changes the color of the first colorant upon application of the first electromagnetic field, and the second colorant maintains a color of the second colorant unchanged upon application of the first electromagnetic field, and

the method further comprises comparing an image I_{g1} on the genuine medium when the first electromagnetic field is applied with an image I_{x1} on the medium whose genuineness is unknown when the first electromagnetic field is applied.

19. The method according to claim 17, wherein

the first colorant changes the color of the first colorant upon application of the first electromagnetic field, and the second colorant maintains a color of the second colorant unchanged upon application of the first electromagnetic field, and

the method further comprises comparing an image I_{x0} on the medium whose genuineness is unknown when no electromagnetic field is applied with an image I_{x1} on

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the medium whose genuineness is unknown when the first electromagnetic field is applied.

20. The method according to claim 17, wherein

5 the first colorant changes the color of the first colorant upon application of the first electromagnetic field, and the second colorant maintains a color of the second colorant unchanged upon application of the first electromagnetic field and changes the color of the second colorant upon application of a second
10 electromagnetic field having a second intensity higher than the first intensity, and the method further comprises:

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15 comparing an image I_{x1} on the medium whose genuineness is unknown upon application of the first electromagnetic field with an image I_{g1} on the genuine medium upon application of the first electromagnetic field.

21. The method according to claim 17, wherein

20 the first colorant changes the color of the first colorant upon application of the first electromagnetic field, and the second colorant maintains a color of the second colorant unchanged upon application of the first electromagnetic field and changes the color of the second colorant upon application of a second
25 electromagnetic field having a second intensity higher than the first intensity, and the method further comprises:

comparing an image I_{x2} on the medium whose genuineness is unknown upon application of the second electromagnetic field with an image I_{g2} on the genuine medium upon application of the second electromagnetic field.

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22. The method according to claim 17, wherein the first colorant changes the color of the first colorant upon application of the first electromagnetic field, the second colorant changes a color of the second colorant upon application of the first electromagnetic field, and a time t_1 required for the first colorant to change the color of the first colorant after application of the first electromagnetic field is shorter than a time t_2 required for the second colorant to change the color of the second colorant after application of the first electromagnetic field, and the method further comprises:

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comparing an image I_{xt1} on the medium whose genuineness is unknown after a time t_3 has elapsed from application of the first electromagnetic field, the time t_3 being not less than the time t_1 and less than the time t_2 , with an image I_{gt1} on the genuine medium after the time t_3 has elapsed from application of the first electromagnetic field.

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23. The method according to claim 17, wherein the first colorant changes the color of the first colorant upon application of the first electromagnetic

field, the second colorant changes a color of the second colorant upon application of the first electromagnetic field, and a time t_1 required for the first colorant to change the color of the first colorant after application of the first electromagnetic field is shorter than a time t_2 required for the second colorant to change the color of the second colorant after application of the first electromagnetic field, and the method further comprises:

comparing an image I_{xt2} on the medium whose genuineness is unknown after a time t_4 has elapsed from application of the first electromagnetic field, the time t_4 being not less than the time t_2 , with an image I_{gt2} on the genuine medium after the time t_4 has elapsed from application of the first electromagnetic field.

24. The method according to claim 17, wherein

the first colorant changes the color of the first colorant upon application of the first electromagnetic field, the second colorant changes a color of the second colorant upon application of the first electromagnetic field, and a time t_1 required for the first colorant to change the color of the first colorant after application of the first electromagnetic field is shorter than a time t_2 required for the second colorant to change the color of the second colorant after application of the first electromagnetic field,

and the method further comprises:

comparing an image I_{gt1} on the genuine medium
after a time t_3 has elapsed from application of the
first electromagnetic field, the time t_3 being not less
5 than the time t_1 and less than the time t_2 , an image
 I_{gt2} on the genuine medium after a time t_4 has elapsed
from application of the first electromagnetic field,
the time t_4 being not less than the time t_2 , and an
image I_{g0} on the medium whose genuineness is unknown
10 when no electromagnetic field is applied.

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